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A REVIEW OF THE FOUNDRY LITERATURE OF THE MONTH.

AMERICAN MANUFACTURER AND IRON WORLD.

AUGUST 26TH.

This journal publishes an illustrated article on "Improved Blast Furnace Casting Apparatus."

The design illustrated was invented by Mr. Michael Killeen, of Bradock, Pa. It is claimed that the device is convenient, and that it materially diminishes the expense and the danger attendant upon the ordinary practice.

It consists substantially of a main trough of cast iron leading from the tap hole to the pig beds, and any number of branch troughs, all being provided with skimming devices. These troughs are lined with loam or any other refractory material.

IRON TRADE REVIEW.

AUGUST 4TH.

A writer, under the nom de plume of "Malleable," says that he has tried mixing steel and wrought iron scrap in the cupola charge, but always without any apparent advantage. He considers not only that the castings are not improved, but he doubts that the steel or wrought iron really mixes with the charcoal pig iron. Indeed, he seems to be of the opinion that it burns up and is, therefore, wasted. This is a very different view from

what is generally entertained on this subject, in so far as pertains to the loss of the steel scrap factor in the mixture.

J. J. writes on the "Necessity of Sharply Watching Foundry Delays."

He recommends that the foundry foreman examine the drawings for new patterns before the latter be made, in order that he may suggest particular features in their construction in order to secure economy and convenience in use. He also emphasizes the utility of making all possible preparation for molding the piece while the pattern is in process of making, in order that there be no delay. He justly remarks that molders often gauge their day's work by the time employed in making the first piece, or number of pieces, and that therefore the foreman should see to it that every possible economy of time be employed at the outset.

J. S. Seaman adds a chapter to the discussion of "Semi-Steel," wherein he carries the history of the process back to 1870. He speaks highly of the process, and avers that castings made of a proportion of charcoal iron and steel mixed in the cupola are closer grained and stronger than those made without the steel addition.

Guy R. Johnson, commenting on a report of Mr. Bush, on thermal tests for car wheels, suggests that excess, either of sulphur or of phosphorus, will produce a wheel that will not stand the test, and that without regard to the carbon content. Excess of sulphur produces the effect of a regular and distinct line of demarkation between the chilled and the unchilled portion of the wheel. Excess of phoshporus seems to have a similar effect, while an iron low in these two elements, and in silicon also, produces the desideratum, viz., an interlacing chill.

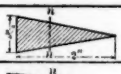
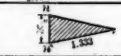
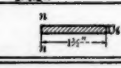
IRON MOLDERS' JOURNAL.

Robert Watson, writing on "A Lesson From Our Losses," says: The present system of training apprentices does not improve conditions in the foundry, but rather that there is a marked decadence in the general ability of molders. He earnestly urges

that a more effective apprenticeship system be adopted; and he, wisely, advises molders generally to be assiduous in improving themselves, in order to their becoming better mechanics. He suggests that they who know how be helpful to the less fortunate, and that all learn a lesson from their losses. He describes a certain loss, in his own experience, and illustrates a method of jacket-core-making by which he prevented subsequent loss.

THE FOUNDRY.

W. J. Keep treats the subject of unequal shrinkage of irregular-shaped castings. He made twelve patterns of different shapes and dimensions, shown in accompanying cuts:

Number of Figure	Shape and Dimensions of Test Pieces.	Shrinkage per foot on Thick Edge.	Shrinkage per foot on Thin Edge.	Convex bend per foot at Thick Edge.	Concave bend per foot at Thin Edge.	Ratio Cubic inches Contents divided by Square inch Cooling Surface.
1		.109″	.133″	.025″	.011″	.156
2		.110″		.012″	0	.161
3		.116″	.124″	.025″	.011″	.104
4		.127″	.135″	.010″	.005″	.113
5		.114″		0	0	.166
6		.134″	.135″	0	0	.060
7		.121″				.125
8		.140″				.041

The information deduced should be valuable. It is true that foundrymen have a more or less vague and general knowledge of the habits of shrinkage and warp in castings of various shapes. But a series of experiments like this, with sectional views, and accurately and plainly tabulated data, kept for convenient reference, would be a thousand times more valuable to the foundry-

man than dimly remembered experience. From examining Mr. Keeps' paper, the suggestion is presented that it would be a good plan to keep a record of shrinkage phenomena in certain shapes of castings made, for reference in subsequent emergencies, as a guide to practice in order to prevent loss.

Mr. Keep found that non-chilling iron was much less apt to warp than chilling iron. He also found that in every case a thin casting shrinks more than a thick one from the same iron.

E. L. Glover discusses the differences in molding in grey and malleable iron. The difficulty, he says, is not so much in the

FIG. 9

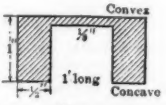


FIG. 10

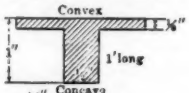


FIG. 11

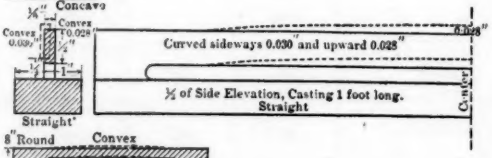
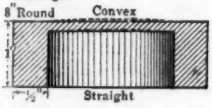


FIG. 12



molding as in the greatly different shrinkage in the two irons. The molder who has worked exclusively in grey iron is entirely unprepared for the shrinkage phenomena that he meets with when he first begins in malleable iron. He states that disproportionately thick areas and sharp angles are cast in contact with a chill in order to insure complete combination of carbon in the former, and soundness in the latter.

The chill, he says, is preferable to the feeding-head in malleable iron, because the latter is apt to leave a spongy or hollow spot at its juncture with the casting.

A foundry clerk shows how to do cost-figuring, deduced from selling price; how to figure cost from lowest possible foun-

dry price; how the foreman may figure cost of any single casting, in order to control the cost of product under way, etc. He takes, first, the total product; second, the wages, and third, total outlay for raw material. To this add (e. g.) 15 per cent. for all other expenses, and 10 per cent. for profit.

He also suggests that the foreman be given a schedule of cost prices at which various classes of work must be turned out, the firm keeping knowledge of running expense and profit to themselves. Records of items of cost are valuable for future reference in order to help out in keeping down cost.

MECHANICAL WORLD.

"Pin Kammer" takes issue with R. D. Moore on the question of feeding castings, and advocates the casting of an extension, to be afterwards cut off, rather than using a greatly diminished feeding head.

IRON TRADE REVIEW.

AUGUST 25TH.

Editor Findley says of P. W. Gates' paper on apprenticeship, read before the Cincinnati Convention of the American Foundryman's Association, that it has aroused new interest in the question.

He says: "Its main proposition, though not put forth in so many words, was that foundrymen may have a higher degree of skill among molders if they will but offer inducements sufficient tc attract it." To further summarize Mr. Findley's remarks, he says, in substance: The small pay offered apprentices to molding, and the unpleasant, exhausting and sometimes unhealthful conditions of the business militate against its securing the attention of the more intelligent and consequently capable boys. The foundry is needlessly dirty and uncomfortable as to adjuncts for the workmen's convenience, and the employers are responsible for this. The hectoring, driving foreman is a principal cause of the peripatetic habits of the molder.

XUM

Reform in the direction of making the foundry building and facilities pleasant and comfortable will raise the molders' trade in the general esteem. In conclusion, Mr. Findley accords very hearty commendation to Mr. Gates' apprenticeship plan, and looks for good fruit from its adoption.

THE TRADESMAN.

AUGUST 1ST.

Writing on the care and use of riddles, Mr. Putnam says: Molders are sometimes compelled by the foreman to use a riddle of coarser mesh than is needed, for the reason that he does not use the riddle as he ought to. Sifting the sand directly upon the pattern will often produce a coarse, rough face in places where the coarser masses or little lumps of sand roll down against a vertical side of the pattern. It is important to stop sifting before all the fine sand has passed through, otherwise the lumps will pass through and come into contact with exposed parts of the pattern, which, in a measure, defeats the very object of riddling the sand. When the consequent rough surface shows up in the finished casting, the foreman, or proprietor, orders a finer riddle to be used. This often aggravates the difficulty instead of curing it, for the molder finds it impossible to riddle sufficient sand to cover the pattern, and at the same time to get up the usual amount of work; so he dumps a considerable part of the sand in without riddling at all, and, in fact, this often makes a better faced casting than where the riddling is more copious but improperly done.

AUGUST 15TH.

Having had a good deal of experience in the making of semi-steel castings, Mr. Putnam says: The fact is that a considerable per cent. of steel, or wrought scrap, may be melted in the cupola with the cast iron and poured into most ordinary castings not only without detriment but with positive benefit in the gain in strength that it gives to all but very light castings. In plow cast-

ings a moldboard of perfectly white section in the fracture can be produced whose strength will be far greater than a merely white iron casting of the same pattern, resulting in a moldboard that will wear much longer, and scour or shed the soil much better than a mold made of common grey iron. There is no difficulty to the expert founder in making semi-steel.

THE MECHANICAL WORLD, MANCHESTER, ENG.

AUGUST 10TH.

This journal contains a long and elaborately illustrated article, reprinted from the Engineering News, on the strength of brackets on cast iron columns.

The most important conclusions to be drawn from the tests here described seem to be the following:

1. That a bracket on a cast-iron column of the ordinary construction will usually not break through the metal of the bracket itself either by transverse strain or by vertical shearing, but it will be torn away from the column, leaving a hole, the upper portion of the fracture beginning at the upper corner of the shelf, and extending through the column at an angle slightly inclined to the horizontal; the lower portion of the fracture extending downwards and outwards through the column at an angle of about 45 degrees.

2. If the total area of fractured surface measured above the plane at the bottom of the shelf be divided into the breaking load, the breaking strength per square inch of fractured area thus computed ranges from 5,700 to 18,000 lbs., when the load is distributed over the bracket, and from 3,600 to 8,400 lbs. when the load is applied near the end of the bracket.

3. If the vertical sectional area of the shelf be divided into the breaking load, the strength per square inch ranges from 7,100 to 23,700 lbs. for distributed load, and from 4,200 to 12,100 lbs. for end load.

4. If the entire vertical section through the bracket, including that of the vertical supports below the shelf, be divided into the

breaking load, the shearing strength per square inch thus computed ranges from 4,100 to 10,900 lbs., averaging 8,000 lbs. for distributed load, and from 2,450 to 5,600 lbs., averaging 4,200 lbs. for end loads.

5. That brackets projecting from 4 to 5 inches from columns will bear only half as great a load when the load is applied at the end of the bracket, as it will when the load is distributed over the shelf of the bracket.

6. That the shelf of a bracket should be so made that the load cannot be concentrated near the end of the bracket, but must be carried as close to the column as possible.